African Study Monographs, Supplementary Issue 3: 71—93, March 1984

Symptoms Are Classified into Diagnostic Categories: Turkana's View of Livestock Diseases

Itaru OHTA
Faculty of Science, Kyoto University

ABSTRACT

Thirty-seven livestock disease categories of the Turkana are examined. Special attention was directed toward their etymology, curative means, and etiology. The Turkana have not developed therapeutic measures. They lack pathogenic explanations and the etiology is of little significance in their dealing with livestock diseases. It is only the classification of diseases which attains high development. All livestock disease names have their etymology in the conspicuous symptoms and/or the parts of body where the given disease occurs. In their system, what is classified is not the disease as the causes of disorder in health, but the conspicuous uncommonness visible on the animals' body. Because the disease names have their motive in the substances of disease (symptoms), referring itself to the morbid condition of animals, functions as a diagnostic process.

INTRODUCTION

The purpose of this paper is to examine how the Turkana recognize, classify, and cope with livestock disease.

Among East African pastoral societies, people make constant effort to maintain and develop their herds. They take animals out daily for grazing and water, and move their settlements according to these needs. The size of a man's herd, however, is not stable. Several factors can be responsible for considerable damage to the herd by reducing the number of animals. Epidemic diseases are one of the most serious causes, as well as raiding by neighboring tribes (e.g. Fukui and Turton, 1979), and severe drought (e.g. Dahl and Hjort, 1976). I have carried out field research among the Turkana, for a total of fifteen months between June 1978 and January 1983. An instance occurred in which the herd of one extended family was seriously damaged by an outbreak of an infectious disease. At the beginning of my research, cards were made for each of the livestock owned by that family. All animals were individually identified, and all members of the herd were identifiable without omission by October 1981. When I visited that family again after eight months in July 1982, I found that of the ninety-seven goat kids born between December 1981 and January 1982, thirty-seven were still present. Six had been killed by hyenas and birds of prey, and fifty-four had died of an infectious disease. Informations on the dead kids were gained by interview based on individual cards. The Turkana called that disease loutokonyen. According to a European veterinary officer who was working among the Turkana, the disease might be rinderpest, common in small ruminants. Many adult goats also died of the disease.

If we recall to mind the significance of livestock among the pastoral societies in East Africa (e.g. Evans-Pritchard, 1940), we can suppose that the

prevalence of such diseases might have a great influence on these societies. However, anthropological studies have scarcely been made on livestock diseases. Descriptions of livestock disease were largely confined to such domains as, prevalence of and administrative counterplan to certain diseases in an area (Sandford, 1919), verterinary description of diseases (Grunnet, 1962), and the discussion of influences of infectious diseases (rinderpest, trypanosomiasis, etc.) on the limitation of pastralists' habitat, and on the inter-tribal relations (Evans-Pritchard, 1940; Deshler, 1960; Dyson-Hudson, 1966; and Spencer, 1973). Some studies focused directly on livestock disease as a part of the description of animal husbandry, and ethnomedicine (Merker, 1910; Evans-Pritchard, 1938; Odede, 1942; Goldschmidt, 1976; Carr, 1977; and Fratkin, 1980). However, none of these studies seem to have fully covered all the diseases recognized by the peoples concerned, and we can acquire only rough images of the peoples' ideas of livestock disease.

The Turkana, Eastern-Nilotic language speakers (Gregersen, 1977), live in the arid land of northwestern Kenya. They depend almost entirely on livestock --cattle, camels, goats, sheep, and donkeys-- for their food. My intensive research was conducted in the northwestern part of their territory around Kakuma town. I collected thirty-seven livestock "disease categories", each of which is labeled by a "disease name", and eight "terms of symptom". It is sometimes difficult to distinguish the terms which are the members of "disease names" from those which indicate only the symptom of the diseases. I make discrimination here that a term which describes the symptom of several diseases, is not a "disease name", but a "term of symptom". The relationship between these two will be discussed later. Data were collected on each Turkana disease for its cause, symptom, curative means, etymology, contagious or not, and animal species affected. The etymology of disease names were presumed from discussion with the informants. Etymology of most disease names were quite apparent to the Turkana themselves, and I seldom heard contrary opinions from different informants.

Having no veterinary training, it was almost impossible for me to identify their disease categories scientifically. This problem was solved by asking a veterinary officer to join in the discussion about the symptom of each disease category with the informants. The officer listed up all diseases by scientific name which were present in the Turkana's territory and might show the symptoms mentioned by the Turkana. The officer's advice was of a great help to me. Because he was born in the Teso tribe whose language is quite similar to that of the Turkana, he could talk to them without interpreters. However in this paper, I do not analyze the correspondence of the Turkana disease categories to scientific disease categories, because the results obtained are not fully convincing. The Turkana have detailed anatomical vocabularies, by which livestock diseases are discussed. The glossary of this vocabulary is shown in Appendix 1.

DESCRIPTION: Disease name, its cause, symptoms, curative means, etymology, and equivalent scientific disease name.

The following description is based on the Turkana's statements about these diseases. Information was gained chiefly by interview, because, during my stay with the Turkana, there were only a few cases in which livestock were attacked by diseases and so I was unable to observe symptoms and the Turkana's curative means of most diseases. Table 1 shows disease names in the Turkana's folk calssification, etymology, livestock species affected, whether they are contagious or not, and the scientific names of the disease most likely to bring about the symptoms described in the Turkana taxonomy. In their language, edeke means "disease".

1. abus

This term means general swelling, both of the skin and the internal organs found after dissection. Some informants explain that abus is not a kind of disease (edeke), others insist that it is. Some explain that when this swelling appears on the skin because of a previous wound, it is not a disease, and that when the swelling with pus appears with unknown cause, it is a disease. This swelling is sometimes mentioned to be discovered on the internal organs of an animal which died of another disease (No. 34). Taken in this connection, the term itself is not a disease, but describes a symptom of a disease. No means of treatment. Scientific possibility: lymphadenitis or swelling caused by skin disease.

2. akitebukin

This term implies "to swell", as in the phrase that "the baloon swells out with gas". Animals die with abrupt swelling of the belly. Grazing too much on some plant species, such as emaret (Indigofera spp.) and esuguru (Tribulus spp.), is thought to bring animals to this sudden death. This condition is explained as "grasses killed the animal (Aaru nginya ebarasit)", and some informants said that akitebukin is not a disease. When cattle drink water after eating a large quantity of fruits of itir (Acacia tortilis), this condition might also be brought about. To treat this condition, people seize the animal and pour water into its mouth. But it is said that this way of treatment has little effect, and that animals die in most cases. Some informants say that this disease coincidentally occurs with another disease called euremem (No. 14). Scientific possibility: bloat, or swelling of the stomach caused by any obstruction in the alimentary tract.

3. amili

Akimilimili means "to glitter". Some liquid, which glitters like water, will be found in the heart of the animal which has died of this disease. While alive, the animal has difficulty in breathing and a rapid heart beat. Mud and small creatures, such as mosquito larvae and tadpoles in the standing water, are responsible for this disease. No treatment. Possibility: heartwater.

4. ebaibai

Ebait means a chap or crack on the skin. Inflicted animals become crippled due to wounds which develop inside the hooves. The muddy condition of the floor in the kraal, caused by animal dung and excess water in the rainy season, is considered to cause this disease. For prevention of this disease people scrape the muddy surface of the ground and take the mud and dung out of the kraal. They also move the position of the kraal inside the village or move the village itself when the ground becomes too sloppy. For treatment, people smear the oil made from milk on the affected parts and put the leg of the animals near the heat of a fire. They cut open the affected parts to squeeze off the pus, smear oil in and tie the hooves together with strings. Possibility: foot-and-mouth disease.

5. edeke lo eidiit

Edeke means disease, eidiit is a folk taxonomical category of animals including tsetse-flies and cicadas. This disease name can be literally translated as "disease of tsetse-fly", and is trypanosomiasis. Probably this term was formed and made popular as the modern veterinary service grew (see No. 20).

6. eidihit

Akidihit means "tail wagging". This disease breaks out in the extraordinary hot season. Affected animals go round nervously with strange

Table 1. Livestock diseases in the Turkana

disease name (vernacular)	etymology	possible diseases	stock affected C K G S D	Con.
1. abus	=swelling	Lymphadenitis or any general lumpy skin diseases	+ + + + −	−
2. akitebukin	=to have bloat, or swelling of the stomach	Bloat or swelling of the stomach caused by any obstruction in the alimentary tract	+ + + + −	−
3. amili	akimilimili=to glitter	Heartwater	+ − + − −	−
4. ebaibai	ebait=chap	Foot-and-mouth disease	+ − + + −	−
5. edeke lo eidiit	edeke=disease, eidiit=tsetse fly	Trypanosomiasis	+ + + + +	+
6. eidihit	akidihit=to wag tail	Heartwater (?)	− − + + −	−
7. eiyala	akiyalakin=to be feverous or dull	fever caused by many diseases	+ + + + +	−
8. ekichodonu	akichodo=to cripple	Foot-rot	+ + + + +	−
9. ekoikoi	akiko=to scratch	Mange mites or any other dermatitis	+ + + + −	+
10. eloro	=a kind of plant	?	− − − + −	−
11. emitina	?	Mange mites	− + − − −	+
12. enomokere	akinom=to burn	Anthrax or blackquater	+ + + + +	−
13. etune	=a pox-like swelling	Goat and sheep pox	− − + + −	−
14. euremem	akiurememe=to breathe fast, to wheeze	general term for difficulty in breathing	+ + + + +	−
15. lobolibolyo	aboliboli=front part of the neck	Bottle jaw caused by fascioliasis or Haemonchus contortus infection	+ − − + −	−
16. lochit	akichirit=to have a toilet accident	?	− − + + −	−
17. logooroi or longarurei	ngigooloi=the tonsil and/or Adam's apple ngingarurei=the lymph nodes in the neck	swollen neck and head due to anthrax, blackquater, etc.	+ + − − +	+
18. lojaala	akijaalat=to slaver	Foot-and-mouth disease	+ − + + −	+

19. lokichuma	akichum=to spear	Blackquater	+	- - - -	+
20. lokipi	akipi=water	Trypanosomiasis	+	+ + + +	+
21. lokit	akit=the ear	East coast fever	+	+ - - +	+
22. lokiyo	ngakiyo=tears	Rinderpest	+	- - - -	+
23. lokoit	akoit=the bone	Joint or limb paralisis caused by east coast fever, trypanosomiasis, etc.	+	- + + -	-
24. lokonyen	ngakonyen=the eyes	Pink-eye	+	+ + + +	-
25. loleeo	?	East coast fever or rinderpest	+	- + + -	+
26. lolewa	akileuware=to die suddenly	Anthrax	+	+ - - +	-
27. lomalitenit	amalitenit=the intestine	Diarrhea caused by parasitism, rinderpest, east coast fever, etc.	+	- + + -	+
28. lonyang	-nyang=yellowish	Anaplasmosis or babesiosis	+	- + + -	-
29. lookot	ngaakot=blood	Pasteurellosis or anthrax	+	+ + + +	-
30. loongorichuno	- ngori=brownish, achuno=dropping	Diarrhea caused by salmonellosis or Escherichia coli infection	+	- + + -	-
31. lopid	apid=the bile	Anaplasmosis or babesiosis	+	- + + -	-
32. lotorobo	atorob=the chest and belly	Trypanosomiasis or anthrax	-	+ - - -	-
33. loukoi	ngiukoi=the lungs	CCPP or CBPP	+	- + - -	+
34. loutokonyen	autori=to be damaged, ngakonyen=the eyes	Rinderpest (?)	-	- + - -	-
35. loyoduka	akiyaduk=(the heart) to beat fast	difficulty in breathing caused by CCPP, CBPP, or any obstruction of respiratory tract	+	- + + -	+
36. nawosin	ewosin=the anus or buttocks	Constipation	-	- + + -	-
37. ngiborok	akiborok=to be wounded around the mouth	Stomatitis, etc.	-	+ + - -	+

C:cattle, K:camel, G:goat, S:sheep, D:donkey, +:affected, -:not affected.

Con.:contagious or not, +:contagious, -:not contagious.

weakened postures, and sit down at last incapable of walking. Then they wag their tail quickly and die. No treatment. Possibility: heartwater (?).

7. eiyala

Akiyalakin means "to be feverous and langid". Affected animals breathe very fast and seem to be inclined to sit in the shade. Their coat fur seemingly bristles up. The Turkana say that this disease is not serious enough to kill animals. For treatment, smashed bark and fruits of eusugu (Zanthoxylum chalybeum) or rhinoceros' droppings, are put into water, and administered orally. Possibility: fever caused by many possible diseases.

8. ekichodonu

Akichodo means "to cripple". Animals limp along because of the splinters, or wounds in their legs caused by small stones. Although it is difficult to discriminate this condition from another disease, ebaibai (No. 4), the Turkana say that while ebaibai affects only cattle, goats, and sheep, ekichodonu, by contrast, occurs in all kinds of livestock. The term akichodo is also applied to human being. Echodo itwan means "a man walks with a limp". So, this term seems to denote general difficulty in walking caused by any of several factors. The Turkana scrape the hooves when they grow too long, or when animals suffer from foot-rot. Hooves are softened first by pressing half-burnt logs down on them, and then are scraped with a knife. Ulcerated parts are picked out. Possibility: foot-rot.

9. ekoikoi

Akiko means "to scratch". Fur of the affected animals falls off little by little, and sores appear on the skin. Animals rub themselves against trees to relieve the itch. Some informants say that flies bring about this disease. Others say that an animal will be infected when it touches the tree on which elephants rub their bodies. For treatment, the animals are forced to drink the mixture of ground laarakimak (Adenia venenata) and water. They treat the sores by smearing donkeys' urine, feces of goats, sheep, cattle, and donkeys, and undigested matter taken from the stomach of slaughtered animals. This disease category may include the symptom of mange mites caused by ticks. But the Turkana do not associate the ticks (emadanit pl. ngimadan) with this disease. Ticks are considered to weaken animals by bloodsucking, or make them blind by entering into the eyes. People take ticks off the animals on occasion. Possibility: mange mites or any other dermatitis.

10. eloro

Eloro is a kind of white mushroom which is not yet identified. This disease attacks only male sheep. The shape of the penis of the affected male sheep becomes to resemble to that of the mushroom. Pus forms inside the penis first, then the urinary bladder also suppurates. Purulent matter is found in the bladder at the time of dissection. When sheep sit down after urinating, the top of the penis is often stained by soil, which causes this disease. People cut open the affected part to press out the pus, wash it with water, and rub salt in. Possibility: unknown.

11. emitina

Etymology is unknown. The fur of the affected animal falls off, and sores appear. The animal suffers from skin irritation. Some informants explained that emitina is the same as ekoikoi (No. 9), and that emitina is a complication of ekoikoi. Others say that these two diseases are different, because ekoikoi attacks goats and sheep, while emitina affects camels. Measures of treatment are the same as with ekoikoi. Possibility: mange mites.

Fig. 1. Aleiyat cut for the treatment of diseases

12. enomokere

Akinom means "to burn" in such phrases like "the sun is burning" or "I got burned on the leg". Sores like fire-burns come out on the whole body of affected animals. They die suddenly bleeding at the nose, mouth, ears, and anus. The blood of affected animal is said to make scars on human skin, if it should get splash on, and human also will be affected. At the time of dissection after the animals' death, clots of blood are found under the skin, in the heart and stomach. The liver and kidneys are hypertrophied. For treatment, people sprinkle dried and powdered leaves of itir (Acacia tortilis) over the sores on the skin. But informants say that this medicine cures only the sores, and it is not effective for the disease itself, and that most of the animals affected by this disease will die. As another curative means, the Turkana cut a part of the skin of the animals' throat (Fig. 1). This operation, called aleiyat (pl. ngaleiyan), is also performed to cure other diseases (No. 18, 19, and 22). This operation is explained to work because something evil, which causes the diseases, will go out of the body together with the blood. The Turkana perform this operation also for the prevention of the diseases mentioned above and other four diseases (No. 20, 26, 28, and 29). Possibility: anthrax or blackquater.

13. etune

Etune, which indicates a pox like tumor itself, will come out upon the whole body of affected animals. Tumors are also found on the stomach and

intestines at the time of dissection. Ekoikoi (No. 9) and emitina (No. 11) are clearly discriminated from this disease in that unusual sores of these two diseases are mere ngajemei, which indicates wounds in general. Animals affected by etune are inclined to sit down in the shade, breathe fast, and cough. According to the informants, their meat is found to be tough like that of porcupines after death. Washing with water is the only means of treatment. Possibility: goat and sheep pox.

14. euremem

Akiurememe means "to breathe fast with difficulty". Some informants say that this disease is the same as akitebukin (No. 2), or that these two diseases break out together. For treatment, heated stones in the fire are pressed onto the chest of the affected animals. Another possibility is to put one of the following pulverized items into water and administer the mixture orally: the fruits of eusugu (Zanthoxylum chalybeum) or ekaiye (Clerodendrum sp.), the stalk of emus (Euphorbia triaculeata) or eegis (Cissus quardrangularis). Possibility: difficulty in breathing caused by many diseases.

15. lobolibolyo

Aboliboli indicates the hanging skin under the throat of animals. The neck swells out, because water forms puddles in the aboliboli. Swollen parts are cut open to press out the water which is said to be transparent. Heated stones or branding irons are pressed on the swollen parts. Possibility: bottle jaw caused by fascioliasis or a Haemonchus contortus infection.

16. lochit

Akichiirit means "to have a toilet accident". This disease attacks only the kids of goats and sheep, which suffer from constipation. They repeatedly take the excretion posture. For treatment, people brand the affected animals on the head, back, horns, and the pelvic region (Fig. 2). Tips of the ears and tail are also trimmed off with knives or spears for the treatment. Possibility: unknown.

Fig. 2. Brand-mark put to the goat kid for the treatment of lochit

17. logooroi (=longarurei)

Ngigooroi means "Adam's apple and/or tonsil". Ngingarurei indicates the lymph nods in the neck. These two diseases are regarded to be the same, although two organs, which provide the etymology of these two disease names are apparently discriminated by the Turkana. The whole neck of the affected animal becomes swollen, and the animal slavers, breathes fast, and foams at the mouth with its tongue sticking out. Lobolibolyo (No. 15) is different from this disease, in that there is water in the swollen part, and the animals become skinny. People press a heated branding iron or stone onto the swollen neck of the animal. Possibility: swollen neck and head due to anthrax, blackquater, etc.

18. lojaala

Akijaalat means "to slaver". Wounds spring up in the mouth of the affected animals, whose teeth then begin to fall out. They slaver profusely. Contaminated standing water is considered to induce this disease. For treatment, eegis (Cissus quardrangularis) is put into water after pulverized, and is poured into the mouth of the animal. People also wash the inside of the mouth with hot water. Another way of treatment is to draw blood. Animals are bled in the same manner as when blood is taken out for consumption. The animal's recovery is explained by saying that the evil being which causes the disease, leaves the body together with blood. This blood is then consumed as usual. Possibility: foot-and-mouth disease.

19. lokichuma

Akichum means "to spear". Many spots which resemble bloodstained spear marks, break out around the shoulders and rump. The affected animal dies suddenly and the color of the meat turns blueish after death. To press the neated branding irons, stones, or half-burnt logs onto the spots on the skin is the common means of treatment. But informants say that these methods have almost no effect, and the animal dies anyway. For prevention of this disease, the Turkana brand a straight line mark about 5 cm long, using a branding iron on the shoulders and rump of the animal. Aleiyat (see No. 12) is also cut for prevention. Possibility: blackquater.

20. lokipi

Akipi means "water". The abdominal cavity of an animal that has died of this disease is found to be filled with water at the time of dissection. The internal organs are nearly floating in the water. Water is also found inside the bones and joints. Affected animals become skinny and smell bad while alive. The hairs on top of the tail fall off, and their belly seems to be full of water. The Turkana recognize that this disease is the same as No. 5, the disease of the tsetse-fly. Some informants, however, point out that eating grass stained by elephants' slaver could also cause this disease. People draw blood from the affected animals for treatment. Smashed bark of eusugu (Zanthoxylum chalybeum) or rhinoceros' droppings are put into water, and the animals are forced to drink. Possibility: trypanosomiasis.

21. lokit

Akit means "ear". The whole head becomes swollen, beginning from the part around the ears, which, at last, swells out as big as that of elephants because of the puddle of water inside. The affected animal moves restlessly about and then dies. Its brain stinks at the time of dissection. Cutting the ears to remove water, or drawing blood are means of treatment. Possibility: east coast fever.

22. lokiyo

Ngakiyo means "tears". Profuse tearing and a runny nose are symptoms of

the affected animal. It breathes with difficulty, and tends to retreat into the shade. Sometimes the fur falls off. This is a good sign that the animal will recover. Bleeding and cutting the aleiyat are measures of treatment. Possibility: rinderpest.

23. lokoit

Akoit means "bone". Water is found in bones of the animals at the time of dissection after death. Their meat is said to be tasteless as the soil. Some informants say that, similar to lokipi (No. 20), eating grass stained by elephants' slaver causes this disease. Putting the smashed bark of eusugu (Zanthoxylum chalybeum) into water and forcing the animal to drink, is the sole means of treatment. Possibility: joint or limb paralisis caused by east coast fever, trypanosomiasis, etc.

24. lokonyen

Ngakonyen means "eyes". This term indicates the morbid condition of the eyes which become cloudy. One of the following materials is powdered and sprinkled into the eyes for treatment: dried fruits of eedung (Boscia coriacea) or ekingoli (Hyphaene sp.), leaves of eebei (Balanites orbicularis), dog or human feces, a mixture of the ashes of hyena feces and wood, or browned sand at the fire place. Possibility: pink-eye.

25. loleeo

Etymology is unknown. The affected animals are attacked by violent diarrhea. Some informants say that flies and ox-peckers transmit this disease from such wild animals as buffallo, eland, giraffe, and rhinoceros. For treatment, one of the following materials is pulverized and put into water, and given to the animal: emus (Euphorbia triaculeata), leaves of epuu (Cadaba rotundifolia) or echuchuka (Aloe sp.), or the ashes of esokoni (Salvadora persica). The leaves of esokoni are also infused into hot water. Possibility: east coast fever or rinderpest.

26. lolewa

Akileuware means "to die suddenly". Affected animals die suddenly suffering from violent diarrhea. No treatment. Possibility: anthrax.

27. lomaritenit

Amaritenit means "intestine". The affected animal is attacked by diarrhea of a nasty stink which finally turns into bloody. At this stage the animal dies. According to informants, this disease differs from loleeo (No. 25), in that it prevails in the dry season while loleeo breaks out in the rainy season, and that this is a disease of cattle only, while loleeo attacks goats and sheep as well. Also bloody feces are not observed in loleeo. No treatment. Possibility: diarrhea caused by parasitism, rinderpest, east coast fever, etc.

28. lonyan

-Nyang means "yellowish". Meat of an animal that has died of this disease is yellowish. The eyes become yellowish, and the animal excretes an unusually yellowish feces. Sores appear on the buttocks, back, shoulders, and ears. According to informants, the fur falling off around these sores is a good sign of recovery. Those animals that do not show this sign will die. No treatment. Possibility: jaundice caused by anaplasmosis or babesiosis.

29. lookot

Ngaakot means "blood". Clots of blood are found under the hide, and in the meat and intestines at the time of dissection. Affected animals are attacked by violent bloody diarrhea. No treatment. Possibility:

pasteurellosis or anthrax.

30. loongorichuno

-Ngori denotes the color of gray to brownish gray, and achuno means "feces". This disease attacks only calves. They discharge dung of unusual color. Some informants say that this disease is the same as lomaritenit (No. 27), both prevailing in the dry season. Fur of the affected animals seems to bristle up, and they refuse to move or to drink water. Sucking milk of cows affected by lokiyo (No. 22), or eating the soil with grass in the dry season bring about this disease. For treatment, smashed bark of ekapaketeng (Albizia anthelmintica) is put into water and given. Boiled water is also effective. Possibility: diarrhea caused by salmonellosis or Escherichia coli infection.

31. lopid

Apid means "the gall bladder". The gall bladder, liver, and diaphragm are found to have hypertrophied after death. The belly of the affected animals, while alive, will swell up as if satiated with grass, and they slaver. No treament. Possibility: anaplasmosis or babesiosis.

32. lotorob

Atorob indicates the frontal side of body from the chest to belly. This disease attacks only camels, whose atorob becomes swollen, as if it is filled with water. Water is actually found at the time of dissection. Heated branding irons are pressed upon the swollen part for treatment. One of the following materials are given to the animal: boiled goat meat which is roasted first without skinning, pulverized emus (Euphorbia triaculeata) mixed with water, or the soup of boiled, unemptied donkey intestines. Informants say that this disease is not so serious as to kill many camels. Camels affected by this disease in the dry season, recover after having diarrhea caused by the fresh grasses eaten at the beginning of the rainy season. Possibility: trypanosomiasis or anthrax.

33. loukoi

Ngiukoi means "lungs". The hypertrophied lungs are found to be conglutinated to the ribs, and clots of blood are discovered around the heart and lungs at the time of dissection. This disease is considered to be prevalent in hilly countries. Affected animals tend to retreat into the shade. They foam at the mouth, and their fur bristles up. People press heated stones upon the breast of the affected animals. This measure, however, is not very effective according to the informants. Possibility: CCPP or CBPP.

34. loutokonyen

Autori means "to show strange symptoms", and ngakonyen means "eyes". The eye-balls of affected animals become retracted. They shed tears, run at the nose, and have diarrhea. They breathe fast and their mouth smells bad because of the oozing pus. They die abruptly. The coat of the recovered animals becomes spotted because of the fur which falls out in splotches. Abus (=swelling, see No. 1) is found in the lungs after death. This is cut out and discarded, while the rest of the lungs is eaten. Loukoi (No. 33) differs from this disease in that all of the lungs is unusually swollen and discolored. Informants said that loutokonyen was a new disease, which had broken out for the first time just recently. They made the animals drink infusions of emus (Euphorbia triaculeata), but this had no effect. Possibility: rinderpest.

35. loyoduka

Akiyaduk means that "the heart beats fast". The affected animal suffers from difficulty in breathing and its heart beats abnormally fast. Although amili (No. 3) also has the same symptom of fast throbbing, amili is a disease

of the heart, while this disease attacks the lungs. Euremem (No. 14) is also different from this disease in that purulent matter is formed in the fat around the heart and the animals cough violently. For treatment, pulverized emus (Euphorbia triaculeata) is put into water and administered orally. Possibility: difficulty in breathing caused by CCPP or CBPP, or any obstruction of the respiratory tract.

36. nawosin

Ewosin means "anus and/or buttocks". This disease attacks only goats and sheep. They suffer from constipation, although they repeatedly take a excretion posture. Lochit (No. 16) is different from this disease because, while the former affects only kids of goats and sheep, the latter attacks adults of both species. Males are castrated for treatment of this disease. The Turkana have three different techniques of castration. The first is to cut open the scrotum with a knife, and remove the testicles and seminal ducts. The second is to bite off the seminal duct from outside without hurting the scrotum itself. The last method which is applied also for the treatment of this disease, is performed as follows; the scrotum is pulled down and a log is set under the stretched out part. This area is then beaten with a wooden hammer cutting off the seminal duct inside. This process is also performed without shedding blood. According to the Turkana's explanation, beating the seminal duct relieves constipation because the pain in the duct, which passes near the anus, stimulates this area. In the case of females, the top of the tail is cut off in order to give impetus to the anus. To pour infusions of emus (Euphorbia triaculeata) into the anus is another means of treatment. Possibility: constipation caused by several diseases.

37. ngiborok

Akiborok means "to have sores around the mouth". This disease has its origin in the wounds in and around the mouth of animals caused by thorns of Acacia trees. Wounds suppurate in the rainy season. For treatment, the blood drawn from livestock, and heated fat which is taken from the mesentery, are smeared on the sores. Possibility: stomatitis, etc.

38. "terms of symptom"

As we have seen, the Turkana point out the most outstanding symptom first, when they describe each livestock disease. I asked the informants what kind of symptoms, other than the most outstanding one, does each disease show in the living animal. I also asked about the symptoms of a living animal inflicted by diseases whose outstanding symptom is found only after death. Now I would like to describe the terms derived from the above mentioned process.

(1) akitouwo: means "to stop going forward". This term indicates the condition of animals that become dull in action, and refuse to move.

(2) akinger akolong: can be literally translated as "to refuse the sun". Animals retreat into the shade to avoid the sunlight.

(3) akiniir: means "to sweat". Although this term indicates the general condition of sweating, it is also applied to unusual sweating of animals caused by disease.

(4) akiyanga: means "to be short of breath with the heart fluttering hard". In contrast to the term, akiurememe (see No. 14) which indicates difficulty in breathing only caused by disease, this term, having wider dennotation, can describe body condition after having heavily exercised.

(5) awalakin: means "to cough".

(6) akilo: means "to be tired". In comparison with aburun, which generally means to become tired, this term points out the languid condition of the body without any apparent reason.

(7) amaran: means "to tremble".

(8) aremori: means "to have diarrhea". This condition is mentioned to occur several times when I asked for symptoms of diseases, No. 25, 26, 27, 29, 30, and 34. Therefore, this term can be regarded to indicate a disease symptom, and not to be a "disease name" itself. However, this term was mentioned by the Turkana as a kind of diseases. When the Turkana find an animal to have diarrhea, they take action against this condition, without further diagnosis. One of the following items is pulverized, mixed in water, and administered orally: emus (Euphorbia triaculeata), eegis (Cissus quardrangularis), or epuu leaves (Cadaba rotundifolia). The ashes of esokoni (Salvadora persica) can also be mixed with water.

DISCUSSION

1. Therapeutics

The Turkana list up thirteen plant species as medicine for fifteen diseases (Table 2). All of them are utilized in the same manner. They are pulverized or burnt into ashes, mixed with water, and given to the affected animals to drink as is, or after boiling.

Twelve kinds of materials derived from animal products are medicinally used for eight diseases (Table 3). Among them, three materials are boiled into soup and given orally. The rest are smeared directly upon the affected parts. Droppings of the rhinoceros are effective, because, according to informants' explanation, they feed on "stimulative plants (ngikyoto lukaduwarak)", such as echuchuka (Aloe sp.), emus (Euphorbia triaculeata), eegis (Cissus quardrangularis), amoja (Sansevieria robusta), abukut (Sansevieria sp.), echorokong (Euphorbia heterocheoma), and eepong (Euphorbia sp.).

Means of surgical treatment without employing medicines, are as follows: a) cut open the affected parts and press out the pus, b) wash the affected parts with water, sand, or salt, c) pull out thorns, d) scrape the hooves, e) press heated stones or branding irons on the affected parts for compress, f) castration of males, and g) cut off the top of female tails. All of these treatments cope directly with symptoms.

Table 2. Medical plants for livestock diseases

vernacular name	scientific name	part used	diseases (see Table 1)
echuchuka	Aloe sp. Liliaceae	l.	25
eebei	Balanites orbicularis Balanitaceae	l.	24
eedung	Boscia coriacea Capparidaceae	f.	24
eegis	Cissus quardrangularis Vitaceae	s.	14, 18
ekaiye	Clerodendrum sp. Verbenaceae	f.	14
ekapaketeng	Albizia anthelmintica Leguminosae	b.	30
ekingoli	Hyphaene sp. Palmae	f.	24
emus	Euphorbia triaculeata Euphorbiaceae	s.	14, 25, 32, 34, 35, 36
epuu	Cadaba rotundifolia Capparidaceae	l.	25
esokoni	Salvadora persica Salvadoraceae	l.	25
eusugu	Zanthoxylum chalybeum Rutaceae	b., f.	7, 14, 20, 23
itir	Acacia tortilis Leguminosae	l.	12
laarakimak	Adenia venenata Passifloraceae	l.	9, 11

b:bark, f:fruit, l:leaf, s:stalk

Table 3. Animal products medicine for livestock diseases

item		usage	disease (see Table 1.)
1.	oil made from milk	smear	4
2.	rhinoceros' droppings	brew	7, 20
3.	undigested material in the stomach of animals	smear	9, 11
4.	donkey's urine	smear	9, 11
5.	droppings of livestock	smear	9, 11
6.	hyena's droppings	smear	24
7.	human feces	smear	24
8.	dog's droppings	smear	24
9.	roasted goat's meat with hair	brew	32
10.	donkey's intestines	brew	32
11.	fat in the mesentery	smear	37
12.	blood of livestock	smear	37

In contrast, such measures as cutting the aleiyat (see Fig. 1) or trimming off the top of the tail and ears, do not directly deal with symptoms. One of the reason why these measures are adopted for treatment of diseases is that blood-drawing itself is considered to cure the animals by releasing the evil being, responsible for making the animals unhealthy. Efficacy of the application of bleeding techniques for the purpose of disease treatment, in the same manner as blood collection for consumption, is backed up by the same explanation.

The aleiyat is also cut for the prevention of diseases, which the above statement cannot explain. The Turkana seem to regard that "marking" itself, by modification of the animal's body has some efficacy for its welfare. When they put ear-marks on the newborn livestock, the same mark as that of its mother is usually chosen. But a specific type of ear-mark is chosen for those which are born after the mother has repeatedly aborted or given birth to still-born infants. This act, called amunyokin, is performed to free the infants from the same fate as their predecessors. Amunyokin is also performed for human being. When a baby is born invalid, the tip of its ear (normally the left ear) is slightly trimmed off. To put marks on the animal's body, is considered by the Turkana to have a certain connection with its welfare, although it is not clear what logic governs this manipulation.

In conclusion, it may be said that the Turkana do not have a great store of curative measures. They have no means at all to deal with a total of eight diseases. Furthermore, the Turkana themselves told me that animals often died because their curative measures were not efficient. Gulliver (1951, p. 25) similary writes, "(the Turkana) feel rather hopeless about the situation and do not know what to do to combat it". Fratkin (1980) reported seventeen livestock health problems of the Ariaal Rendille, which he classified in eleven infectious diseases and six minor veterinary problems. He states that they have no means of traditional treatment for six of these problems. Evans-Pritchard (1938) also points out that the Nuer have few medical cures for their cattle. Among the East African pastoral societies, it seems to be common for these peoples to have few herbal medicines for livestock diseases. For the treatment, they commonly practice ear-cutting, branding, and blood-drawing (Merker, 1910; Odede, 1942; and Evans Pritchard, 1938), as well as, direct surgical treatment of affected parts.

2. Etymology

(a) Disease names derived from their typical symptoms

Among the thirty-seven disease names, the etymology of two names are unknown (No. 11 and 25). For six names, the etymology is aparrent but the original terms themselves describe unusual conditions caused by disease (No. 1: swelling, No. 7: feverous, No. 13: pox-like swelling, No. 14: difficulty in breathing, No. 35: severe palpitation, and No. 37: wounds around the mouth). For the remaining twenty-nine disease names, it is possible to analyze what traits of the diseases are paid attention to, when the Turkana make disease names.

The etymology of disease names can be classified into the following two categories:

(1) ten names are derived from the terms which indicate a part of the body (No. 15, 17, 21, 23, 24, 27, 31, 32, 33, and 36). It is apparent that these names are selected after the parts of the animals' body, either where striking symptoms are found, or which are considered to be affected by the Turkana.

(2) eighteen names have their etymology in general terms which originally have no connection with the diseases themselves. These terms describe abnormal behavior (No. 6, 8, 9, 16, and 18) or unusual conditions (No. 2, 3, 4, 10, 12, 19, 20, 22, 26, 28, 29, 30, and 34) of the affected animal. The one remaining disease name (No. 5) which refers exceptionally to its cause, was possibly made after the spread of modern veterinary activities in the area.

We can conclude that the Turkana select livestock disease names by paying attention to abnormalities actually found in the animals. Six disease names, excluded from the analysis because the original terms symbolize the morbid condition by themselves, also can be regarded as having their etymology in the actual symptoms.

Evans-Pritchard classifies the etymology of human diseases of the Azande into five categories:

(1) diseases named simply after the part affected.
(2) diseases named after the sensations they produce or their effects on the organism.
(3) diseases named after something in the nature to which they bear resemblance.
(4) diseases named after their causes.
(5) diseases named after their cures (1937, p. 482-483).

Compared with the Azande disease etymology, it is notable that the Turkana etymology completely lacks categories (4) and (5), and that only one disease name (No. 10: a kind of mushroom) fits the category (3). In conclusion, all livestock disease names are derived from neither their causes nor cures, but rather allude to the conspicuous symptoms visible on the body of the animal.

(b) Disease names derived from post-mortem symptoms

Among disease names of the Turkana, which have their etymology in symptoms, seven are derived from post-mortem symptoms. Four of these refer to the abnormal condition of the organs (No. 3, 20, 28, and 29) and three (No. 23, 31, and 33) to the parts where conspicuous morbid states are found.

The Turkana eat livestock even when they have died of disease. The diseased parts are cut out and thrown away. Conspicuous morbid changes of the affected organs appear to leave a profound impression on the Turkana at the time of dissection. These seven disease names show the specificity of livestock disease naming. That is, conspicuous changes of the internal organs are discovered because animals are cut up for consumption after death.

3. Etiology and pathology

The Turkana are keenly conscious of the contagiousness of each disease (see Table 1, "to give a disease to another" = atapakin). They say that animals of one herd may catch certain diseases from others by using the same watering or resting places.

But for most diseases, they have no pathogenic explanations. I had repeated interviews with the informants to ask about the causes of each disease. However, I obtained quite poor responses. Causes for only eleven diseases were mentioned. It is noteworthy that all of them are realistic and immediate causes, such as, to take or touch something harmful for the health. Furthermore, I found some discrepancies in opinion concerning the causes of these diseases. For the Turkana, it seems to me that the cause of disease is seldom considered. Informants typically replied, "we do not know (its causes)", or "Akuju (God) caused the disease". Talking with the Turkana on occasion, I would hear statements attributing the death of livestock to human acts. For example, if a woman should commit adultly, her husband's livestock would die one after another. If such troubles were to occur, it would be settled through certain rituals in which prophets (emuron pl. ngimurok) are called in for consultation. But as I have examined above, among the Turkana, none of the livestock disease categories have a specific connection with certain human acts. They do not attribute the outbreak of livestock diseases to human acts, such as witchcraft or violations of rules or taboos.

Foster (1976) classifies human disease etiology into two principal categories: naturalistic and personalistic. He states that while personalistic etiologies have at least two levels of causality (effective cause and immediate or instrumental cause), these levels of cause are much less apparent in naturalistic etiologies. In the light of his classification, the Turkana's explanation of etiology is naturalistic at the most, lacking completely personalistic explanations which attribute the cause of disease to "the active purposeful intervension of an agent" (ibid., p. 775). Foster (ibid.) also points out that principal cures are therapeutic in the naturalistic system, while diagnosis plays the most important part in the personalistic system. The Turkana's measures of coping with livestock disease are therapeutic.

Although naturalistic etiology is applied to some diseases, the etiology of most diseases is "unknown = because of the God", for the Turkana. I neither observed nor was ever informed that the Turkana attributed the actual outbreak of livestock disease to the God. They never moved against the disease by working through the God. I suppose that such a case is very rare, though not absent, among the Turkana. What deserves special emphasis is that the Turkana lack pathogenic explanations of disease, and that the etiology signifies little in the Turkana's view of livestock diseases. Their attitude to the prevalance of livestock disease is characterized by the fatalistic acceptance of the harsh realities of life.

CONCLUSION

It was pointed out that seven disease names have their etymology in post-mortem symptoms. The existence of these names suggests that these diseases are satisfactorily recognized after the animal's death, and that they are not diagnosed while the animal is still alive. When I was told that an animal was sick, I would ask, "with what disease is it affected?" I was sometimes given the name of a disease which can only be ascertained after the animal's death. I would then ask how they could make that diagnosis without actually seeking the internal symptoms. The informants would then list several symptoms, such as, to retreat into the shade, to refuse to move, etc. It is apparent,

however, that people fail to diagnose these diseases while the animal is alive, because the symptoms which they key in, are similarly shown in other diseases. Then, why did the informants answer my questions with those disease names ascertainable only at the time of dissection? We can suppose that they read the delicate shades of the animal's condition, too delicate for a verbal picture, and that they are capable of making a diagnosis after all. I, however, do not take it as an explanation in point. I think that, when they told me that the animal was sick, it was out of the question for them to make a diagnosis, because the animal showed none of the significant symptoms. Nevertheless, I asked the "name" of the disease, and they were driven to answer the possible disease names, which they themselves did not feel sure of.

The reason why it is out of the question for the Turkana to diagnose under the above situation, can be understood through the examination of the characteristics of the Turkana's disease names. Before progressing any further, I would like to discuss how they recognize the disorder by which they judge the animal to be sick.

In everyday life, the Turkana pay unflagging attention to the health of their animals. Each individual animal is always observed closely, and various abnormal conditions are read from its behavior and appearance. Then, when an animal is apt to stop walking normally, or to retreat into the shade over and over again, people take these behaviors as morbid signs. Noticing these conditions as morbid, people deal with the condition by drawing blood, cutting the aleiyat, or trimming the top of the tail and ears off. To my question, "for the treatment of which diseases do you draw blood ?" informant pointed out akitouwo (=to stop walking, see No. 38), in addition to several other disease names. Akitouwo cannot be a "disease name" if we lay down the criterion that the term which is used to describe a symptom of several diseases, is not a disease name, but rather a term of symptom. Therefore, it follows that, when people find that an animal has stopped walking, the disease is not diagnosed, because the disease name is not yet confirmed. In some cases when the Turkana subject an animal to a certain treatment, they do not attempt to diagnose the disease. When they find that an animal shows some unsoundness, they employ certain means of dealing with the animal's general condition of "it being sick (edyaka)". It functions as a diagnosis for the Turkana to prove the animal to be sick, irrespective of any disease category. To judge an animal to be sick is enough for them to adopt some curative means, such as, drawing blood or trimming the top of ears off, etc.

Lastly, I would like to discuss what it really is for the Turkana to make a diagnosis. They do this by applying the disease name to the condition of the animal. This process will be made clear through the investigation of the characteristics of their disease names.

The Turkana disease names express the conspicuous morbidness which appear on the animal's body, by referring to these abnormal physical states or to the part of the body where the morbidness occurs. In another words, each disease Came refers to the symptom. Disease names are apparent symptoms themselves which become the target of reference. What is classified is not the diseases which make the animal sick, but the visible irregularity of the animal behavior or body condition. Each disease category is constituted by the conspicuous symptom in and for itself. For example, informants pointed out bloody excrement as the symptom of both lomaritenit (No. 27) and lookot (No. 29). Lookot is characterized by internal hemorrhage found at the time of dissection. This is absent in lomaritenit. From a standpoint that diseases are diagnosed by examination of the syndrome, we can explain the relationship of these two diseases as follows; lomaritenit is a comprehensive term including lookot, and lookot is one of the sub-types of lomaritenit, because bloody excrement is found in both diseases and lookot has further defining traits, which lomaritenit does not have. If we accept this explanation, Turkana's disease classification seems to have a stratified structure.

However, the Turkana's diagnosis does not follow the above thread of logic. Because, for them, lomaritenit, on the one hand, refers to bloody excrement, while on the other hand, lookot refers to another independent condition of internal hemorrhage, which has no connection with bloody excrement. Those animals which are found to be affected by lookot at the time of dissection, surely have bloody excrement while alive. Informants pointed out this symptom in answer to my question, as I repeatedly asked the symptoms of lookot. However, in diagnosing, lookot is out of the question for the Turkana while the animals are still alive, because lookot refers to the condition which is brought to light only when the animals are anatomized. After all, an animal can be affected by both lomaritenit and lookot in the course of time.

In the Turkana's classification, each disease category has distinct singularity and the system does not have a stratified structure. The following example shows this clearly. When an animal is affected with foot-and-mouth disease, conspicuous symptoms occur in the mouth and feet. The Turkana's categories of ebaibai (No. 4) and lojaala (No. 18) include respectively the condition caused by foot-and-mouth disease. Therefore, the Turkana are likely to judge that an animal, which is affected with foot-and-mouth disease, is suffering from both ebaibai and lojaala, because the animal will show two distinct symptoms. These two disease categories are not incompatible with each other, and neither of them contains the other. It is not necessary that ebaibai and lojaala always come about at the same time, because both of them are not foot-and-mouth disease itself. Scientifically speaking, similar conditions with the symptom of foot-and-mouth disease may be brought about by other diseases, and will be judged to be ebaibai or lojaala by the Turkana. The Turkana themselves do not consider that ebaibai and lojaala always arise together. They do not have a disease name which refers to the total condition of an animal affected by foot-and-mouth disease, although such a situation certainly can occur that an animal shows conditions of both ebaibai and lojaala. Two disease categories are never combined into a higher category. Each disease category is independent and put side by side with one another on a single level, because, as I have analyzed, each category represents single independent symptom. Lolewa (No. 26) has its etymology in the term (to die suddenly), which, in a sense, indicates the outcome of the disease. The existence of such a disease category can be easily understood in due consideration of the characteristics of the Turkana diagnosis. They make a diagnosis by referring to a conspicuous unique condition of the animal.

In the beginning of this paper, I discriminated "terms of symptom" from "disease categories". These terms were not mentioned by the informants when I asked them to list up disease names. They were mentioned for the first time when I asked about the symptoms of the diseases. These terms do not belong to a different level from disease categories as they might appear to. The conditions indicated by these terms are, I suppose, too indefinite to be referred to by disease names, because the Turkana disease names are formed by paying attention to conspicuous morbid states. I classified aremori (=to have diarrhea, see No. 38) as a term of symptom because this term is mentioned in describing symptoms of several diseases. But the Turkana listed this term as a disease name, and they have curative measures for this condition. That is to say, the conditions represented by the terms of symptom are definite in some terms and indefinite in others. Therefore, aremori is a disease category for the Turkana, because it indicates an actual substance, and other indefinite terms are not nominalized to form disease names.

In a genaral way, the following two subjects are distinct from each other: the question of etymology of disease names, and the question of the substance and diagnosis of diseases, because it is a characteristic of human language that the relationship between the signifiant (disease name) and signifié (substance of disease) is arbitrary. But in the Turkana's

classification of livestock diseases, each disease name has its motive in its subject matter. Referring itself to the morbid condition functions as a process of diagnosis. What draws our attention to the Turkana's way of coping with livestock disease, is that they have a rich vocabulary to refer to the observable abnormality of animals, and that to apply this vocabulary in the right place has a diagnostic function. Their etiology of livestock disease is not a highly developed one, and their therapeutic measures of curing diseases do not seem to be advanced to the point of producing the desirable effects. However, their disease classification system is highly complex. The Turkana do not call what lies beyond the phenomena into question, but fractionalize the phenomena and give names to each part. This classification and naming of diseases supply the means, by which it is made possible to exchange information about the livestock diseases which arise in daily life, and to organize the phenomena giving form and meaning to it.

ACKNOWLEDGEMENT

My study of the Turkana was undertaken in the capacity of reserch associate at the Institute of African Studies, University of Nairobi. Professor B. E. Kipkorir, the former director of the Institute, kindly gave me assistance in carrying out the fieldwork. Professor J. Itani of Kyoto University gave me great help in the planning and performance of fieldwork and in the analysis of the data. Professor J. Tanaka of Hirosaki University, the research team director, made it possible for me to conduct the fieldwork. Dr. M. Ichikawa kindly read the earlier drafts of this paper, and gave many helpful comments. Colleagues at the Laboratory of Human Evolution Studies, Kyoto University, also encouraged this study. Mr. D. Akabwai, the veterinary officer in the Turkana, helped me in scientific identification of the Turkana livestock diseases. Mr. A. H. Ardung helped me not only as an exellent interpreter, but also as a genuine friend in the research field. Other numerous Turkana people offered me friendship. To these people, I make grateful acknowledgement.

REFERENCE

Carr, Claudia J., 1977. Pastoralism in Crisis: the Dasanetch and their Ethiopian Lands. The Department of Geography, University of Chicago, Chicago, Illinois.

Dahl, G. & A. Hjort, 1976. Having Herds. Stockholm studies in social anthropology 2, Stockholm.

Deshler, W., 1960. Livestock trypanosomiasis and human settlement in northern Uganda. Geographical Review 50: 541-554.

Dyson-Hudson, N., 1966. Karimojong Politics. Oxford University Press, London.

Evans-Pritchard, E. E., 1937. Witchcraft, Oracles and Magic among the Azande. Clarendon Press, Oxford.

_____, 1938. Economic life of the Nuer: cattle. Sudan Notes & Records 21: 31-77.

_____, 1940. The Nuer. Oxford University Press, London.

Foster, G. M., 1976. Disease etiologies in non-Western medical system. American Anthropologist 78: 773-782.

Fratkin, E. M., 1980. Concepts of Health and Disease among the Ariaal Rendille. Ph. D. thesis, University of London.

Fukui, K. & D. Turton, 1979. Warfare among East African herders. Senri Ethnological Studies 3, Osaka.

Goldschmidt, W., 1976. Culture and Behavior of the Sebei. University of California Press, California.

Gregersen, E. A., 1977. Language in Africa: An Introductory Survey. Gordon and Beach, New York.

Grunnet, N. T., 1962. An ethnographic-ecological survey of the relationship between the Dinka and their cattle. Folk 4: 5-20.

Gulliver, P. H., 1951. A Preliminary Survey of the Turkana. Cape Town.

Merker, M., 1910. The Masai. HRAF Files, FL12 Masai, Source No. 18.

Odede, W., 1942. Luo customs with regard to animals (with particular reference to cattle). J. of the East Africa and Uganda Natural History Society 16: 127-135.

Spencer, P., 1973. Nomads in Alliance. Oxford University Press, London.

Sandford, G. R., 1919. An administrative and political history of the Masai Reserve. HRAF Files, FL12 Masai, Source No. 4.

APPENDIX 1. Turkana anatomical vocabulary

English	Turkana	
	singular	plural
abdomen	akooki	ngakookes
ankle	etobolait	ngitobolai
anus	ewosin	ngiwosi
arm and leg; top bone	akalokidin	ngakalokidinyo
arm or front leg	akwat	ngakwas
arm-pit	akiriddidi	ngakiriddidia
back	akau	ngakaua
back; a part of	eguru	ngigurai
back; a part of waist	achir	ngachirin
baldness	angole or apalore	ngangole
beard	epenek	ngipeneka
belly; a part of	atorob	ngatorobo
bile	ngakipi a apid	
bladder	ekulam	ngikulamya
blood	ngaakot	
body	akwan	ngakwat
bone	akoit	ngakoiyo
bone marrow	akimet a akoit	
bottom	ekawosiwosit	ngiwisiwisi
bottom	ewosiwosit	ngiwisiwis
brains	ngadam	
breast or udder	esikina	ngisikin
buttock	epateit	ngipate
cheek or temple	amatengen	ngamatengen
chest	erarum	ngirarumyo
chest	emosiring	ngimosiringai
collarbone	elaagamit	ngilaagam
diaphragm	akab	ngakabua
ear	akit	ngaki
ear lobe	ebonibonit	ngibonibon
elbow	esidongoror	ngisidongororya
eye	akong	ngakonyen
eye-ball	echopot a akong	ngichop
eyelashes or eyebrows	akiirit	ngakir a ngakonyen
eyelid	amunyi a akong	
face	ereet	ngireetin
female genitals	akiboni	ngabonyo
finger or toe	ekimoon or ekimoin	ngimoyo
fist	akilulung a akan	
foot	akeju	ngakejen
gall-bladder	apid	ngapidya
gourment	lonye	talonye
hair	etimat	ngitim
hairs of body	ajulot	ngajul
hand	nidapal a akan	
hand or arm	akan	ngakan
head	akou	ngakoui
heart	etau	ngitai
heel	atitinyo	ngatitiny
hip-bone	ekalokot	ngikalokoi

APPENDIX 1. (Continued)

English	Turkana	
	singular	plural
hip-bone; left	ekalokot lobeluna	
hip-bone; right	ekalokot lotenuna	
intestine; large intestine	epooli	ngipoolya
intestine; small intestine	amalitenit	ngamaliten
jaw	abokony	ngabokonya
joint	ngigeshe	
kidney	engalura	ngingaluru
knee	akung	ngakungin
knee-cap	apurukuchi	ngapurukucho
leg	amuro	ngamuroi
leg (man)	akeju	ngakejen
leg and arm; lower bone	ekipisit	ngikipiis
leg; left front	akwat na ngapesuru	
leg; right front	akwat na akon	
lips	eponoi	ngipon
liver	emany	ngimanyin
lower jaw	abokonyi	ngabokonyin
lower part of the abdomen	alipong	ngaliponga
lung	euko	ngiukoi
molar	ekaturoongot	ngikaturoongoi
mouth	akituk	ngakituk
nail	emagorit	ngimagor
nape of neck	asidikidik	
navel	akapul	ngakapulya
neck; back of	eluute	ngiluutei
nose or nostril	ekume	ngikumes
occiput	amedo	ngamedoi
palm of the hand	tooma a akan	
penis	amiri	ngamiryo
placenta	angasep	ngangasepa
pubic hair	ngitim (or ngajul)	
rib	amaran	ngamaran
rib; side of chest	esyep	ngisepyon
shin (bone of)	akatoroongot	ngakatoroongoi
shoulder	eseget	ngisegeta
skin	amuny	ngamunyin
skull (man)	akulului	ngakululuyo
spine	eutune	ngiutunei
spleen	etid	ngitidai
stomach	aboi	ngaboi
stomach; 1st	aboi	ngaboi
stomach; 2nd	apunuka	napunukai
stomach; 3rd	amekeni	ngamekeni
stomach; 4th	atenus	ngatenusho
teat; nipple	etupanit	ngitupan
tendon	ngamori	
testicle	etout	ngitou
throat	edokole	ngidokolei
tongue	angajep	ngangajepa
tonsil or Adam's apple	egooroit	ngigooroi

APPENDIX 1. (Continued)

English	Turkana	
	singular	plural
tooth; front tooth	ekyalai	ngikyal
tooth; molar	ekaturoongot	ngikaturoongoi
trachea	eporoto	ngiporoto
uterus	aperit	ngaperito
uvula	ejakileit	ngijakilei
uvula; meat of uvula and gums	angirit	ngangirito
vein	akyep	ngakyepa
waist	aabor	ngaaborya
white hair	akoroit	ngakoro
wrist	ngigeshe a akan	